

**What is claimed is:**

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1. A protein having glucosyltransferase activity comprising an amino acid sequence, which exhibits at least 50% amino acid identity, as determined by the BLAST algorithm, with the amino acid sequence 531-1781 of SEQ ID No. 2 or a part thereof having at least 15 contiguous amino acids which are identical to the corresponding part of the amino acid sequence 531-1781 of SEQ ID No. 2.
  2. A protein according to claim 1 comprising an amino acid sequence, which exhibits at least 60% amino acid identity with the amino acid sequence 531-1781 of SEQ ID No. 2.
  - 10 3. A protein according to claim 1 comprising an amino acid sequence, which exhibits at least 70% amino acid identity with the amino acid sequence 531-1781 of SEQ ID No. 2.
  - 15 4. A protein according to claim 1, which exhibits at least 50% amino acid identity, as determined by the BLAST algorithm, with the amino acid sequence of SEQ ID No. 2 or a part thereof having at least 15 contiguous amino acids which are identical to the corresponding part of the amino acid sequence of SEQ ID No. 2.
  5. A protein according to claim 4, which exhibits at least 60% amino acid identity with the amino acid sequence of SEQ ID No. 2.
  - 20 6. A protein according to claim 4, which exhibits at least 70% amino acid identity with the amino acid sequence of SEQ ID No. 2.
  7. A protein according to claim 1, comprising an amino acid sequence of at least 200 amino acids which exhibits at least 55% amino acid identity with the corresponding part of the amino acid sequence 972-1514 of SEQ ID No. 2.
  - 25 8. A protein according to claim 1, comprising an amino acid sequence of at least 200 amino acids which exhibits at least 65% amino acid identity with the corresponding part of the amino acid sequence 972-1514 of SEQ ID No. 2.
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9. A protein according to claim 1, comprising an amino acid sequence of at least 100 amino acids exhibiting at least 50% amino acid identity with the corresponding part of the amino acid sequence 1515-1781 of SEQ ID No. 2.
  10. A protein according to claim 1, comprising an amino acid sequence of at least 100 amino acids exhibiting at least 60% amino acid identity with the corresponding part of the amino acid sequence 1515-1781 of SEQ ID No. 2.
  11. A protein according to claim 1, comprising at least one of the amino acids Pro-1026, Ile-1029, Met-1034, Asn-1035, Ser-1136, Ala-1143, Ile-1170, Leu-1223, Ala-1413, Val-1418, Ala-1428, Leu-1442 in the same relative position as the corresponding amino acids of the amino acid sequence of SEQ ID No. 2.
  12. A protein according to claim 1 which, in the presence of sucrose, produces a glucan having 38-48% 4-linked anhydroglucose units, 17-28% 6-linked anhydroglucose units, and 7-20% 4,6-linked anhydroglucose units.
  13. A protein according to claim 1 which is a recombinant protein.
  14. A nucleotide sequence encoding a protein according to claim 1.
  15. A nucleic acid construct comprising the nucleotide sequence of claim 14, operationally linked to an expression-regulating nucleic acid sequence.
  16. A recombinant host cell containing one or more copies of the nucleic acid construct according to claim 15.
  17. A process of producing a protein of interest, such as a glucosyltransferase, comprising culturing a host cell according to claim 16 or a *Lactobacillus* strain containing said glucosyltransferase in a culture medium, and recovering the protein from the culture medium or the cell free extract.
  18. A process of producing an oligosaccharide or polysaccharide of interest, using a protein according to claim 1.
  19. A glucan comprising at least 20, up to about 100,000  $\alpha$ -anhydroglucose units, 38-48% of which are 4-linked anhydroglucose units, 17-28% are 6-linked anhydroglucose units, and 7-20% are 4,6-linked anhydroglucose units and/or gluco-

oligosaccharides containing at least two 4-linked anhydroglucose units, at least one 6-linked anhydroglucose unit and at least one 4,6-linked anhydroglucose unit.

20. A chemically modified glucan, which is obtained by 2,3-oxidation, 6-oxidation, phosphorylation, acylation, hydroxyalkylation, carboxymethylation, amino-alkylation of one or more anhydroglucose units of a glucan or gluco-oligosaccharides according to claim 19.
21. A probiotic of symbiotic composition containing a *Lactobacillus* strain capable of producing a glucan and/or gluco-oligosaccharide according to claim 19 and/or a fructan.
22. A process of improving the microbial status in the mammalian colon comprising administering an effective amount of a *Lactobacillus* strain capable of producing a glucan and/or gluco-oligosaccharide according to claim 19 and/or a fructan.
23. A process of improving the microbial status of the mammalian colon comprising administering an effective amount of a glucan or gluco-oligosaccharide according to claim 19.

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